

fulfilled while maintaining effective configuration of the current configuration when the display preferences cannot be fulfilled;

reconfigure operable coupling of the multiple displays to the computing system such that the at least one of the multiple displays is configured in accordance with the display preferences when the current configuration can be reconfigured;

operably couple a display controller of the computing system to the at least one of the multiple displays, the display controller providing display data to the at least one of the multiple displays;

operably couple the display controller to at least one of a plurality of screen memories, each of the plurality of the screen memories storing separate display data and the display controller retrieving the display data from the at least one of the plurality of screen memories; and

operably couple the display controller to at least one of a plurality of display drivers, each of the plurality of display drivers writing the separate display data to the plurality of screen memories.

B3
canceled

REMARKS

Applicants wish to thank the Examiner for the interview granted on May 26, 2000 with regards to the above-identified application. Pursuant to that interview, Applicants are providing this Amendment after Final in which the claims have been amended to distinguish over the cited prior art.

Claims 1- 41 are pending in the above-identified application. With this Amendment, Applicants have canceled, without prejudice Claims 1-13, 15, 16, 20, 25-28 and 34-37. Independent Claim 14 has been amended to include all limitations of dependent claims 15, 16 and 20. Independent Claim 24 has been amended to include all the limitations of dependent claims 25, 26, 27 and 28. Independent Claim 33 has been amended to include all the limitations of dependent claims 34, 35, 36 and 37. Each of the independent claims has been amended to more clearly identify Applicants' invention and, in particular, to point out that the coupling controller, when necessary, causes the

videographics processing circuitry to be reconfigured. Single videographics card drives multiple displays and provides dynamic coupling of displays to the display controller. One example on page 6, lines 26-31 and on page 7, lines 1-9 of the Specification illustrates that with the present invention the association of display controllers, display drivers, displays and portions of screen memories can be reconfigured for optimal performance.

The independent claims have been amended to include limitations of a plurality of screen memory portions having separate display data, plurality of display drivers and a coupling controller that reconfigures essentially the display drivers and screen memory portions with display controllers and displays.

The prior art of Kou, (U.S. Patent No. 5,874,928) teaches a method and apparatus for driving a plurality of displays simultaneously, but does not suggest the use of a coupling controller for effecting the driving of such displays. Kou teaches a mechanism which enables the use of the same graphics data stream to run two separate displays, yet refresh each display using an independent clock rate. Kou teaches using one display controller and only one set of graphics data to drive multiple displays. Kou manipulates the graphics data for desired display and sets clock rates to optimize the refresh rate for each display. However, Kou does not teach the use of multiple display controllers and multiple screen memories, which are configured under the control of a coupling controller.

U.S. Patent No. 4,980,678 issued to Zenda is directed to a display controller for a CRT/flat panel display apparatus. The '678 patent of Zenda teaches that a flat panel display as well as a CRT display unit can be operated from a single computer. Zenda describes in Col. 5, ll. 19-57 that keyboard commands can cause the display to be switched from the flat panel display to the CRT display. Zenda teaches that the CRT controller selectively display drives the CRT 19 and PDP21, based on display timing signal generating parameters set in display timing registers 27. (See Co. 3, ll. 44-48) Zenda in FIG. 3 shows an arrangement of palette 13 which sends 6-bit display data to CRT 19. The 6-bit display data is constituted by red, green and blue bits, and supplementary bits for the red, green and blue bits, respectively. Col. 13 also outputs two bits of the 6-bit display data to the PDP interface 23.

Kou teaches driving simultaneously a plurality of displays from a set of graphics data stored in a display memory. The graphics data is read out of the video buffer at a rate determined by video clock signal. Kou teaches the use of a write buffer providing a mechanism for changing clock rates. This allows different types of video displays to be driven such as CRT type displays as well as LCD type displays.

The Examiner has also cited another patent of Zenda, U.S. Patent No. 5,559,525. The '525 Zenda patent is directed to a flat panel display control system. As described in Col. 7, beginning at line 44, the '525 Zenda patent teaches that a first display controller outputs display data to be displayed on a color LCD panel and also on a color CRT display unit. The first display controller generates a signal that the timing for the VGA, which is a common timing for both the CRT and LCD displays. The first display controller can also generate signals at the timing of the standard VGA feature connector. This is the timing for the CRT.

Each of these three prior art references is directed in general to providing and driving multiple displays of different types from a single computer. However, what none of the prior art references teach is a system wherein display drivers, display controllers, the displays themselves (CRTs and LCDs), as well as sections of memory, can be associated with one another and reassociated on an as needed basis in order to provide optimal displays. On page 10 of the Specification of the present Application in lines 6-20 it is explained that, according to the present invention, display preferences may be received from a user via a user interface or from an application via a CPU. In either case the display references provide an image to display selection, or selections, such that a particular one of the displays selected to display a particular image. The configuration properties of the display relate to limitations of the display, while configuration properties of the computer system relate to the capabilities of the display controllers and to computing system rules. The display controllers may be designed to support a television, an LCD display, a low resolution and/or refresh rate CRT display, a high resolution and/or refresh rate CRT display, and/or to support 8, 16, or 32 bit/pixel display data. Also, on page 10 beginning at line 25, it is set forth that according to the present invention the configuring of the computer system and the displays include operatively coupling a display controller of the computer system to the displays; includes operatively coupling the display controller to at

least one of the screen memories, including operatively coupling the display controller to at least one of a plurality of display drivers.


None of the prior art references taken either singly or in combination discloses or anticipates the dynamic coupling of displays to display controllers such that image quality can be optimized, user preferences can be accommodated and application differences can be accommodated. The prior art references teach and disclose the well known concept of providing a single image on a plurality of display simultaneously, or providing images on different types of displays that are connected to a single computer, whereby, however, the system is not reconfigured as taught by the present application for providing such displays.

With the amendment to the Claims, Applicants now have clearly defined the present invention over the cited prior art. The Examiner is therefore respectfully requested to reconsider the rejection of the claims under 35 U.S.C. Sec. 103(b) as set forth in the Remarks of the Final Office Action.

The Examiner rejected Claims 1-13 under 35 U.S.C. §112 in the Final Office Action. Applicants have hereby canceled, without prejudice, Claims 1-13 and therefore any discussion of the rejection of these claims is deemed moot.

Applicants now believe that the amended claims are patentable over the cited prior art, taking either singly or in combination. Therefore, Applicants believe that the present application is in condition for allowance and such action at an early date is earnestly solicited.

RESPECTFULLY SUBMITTED,

By: 
John R. Garrett
Registration No. 27,888

Markison & Reckamp, P.C.
P. O. Box 06229
Wacker Drive
Chicago, IL 60606-0229
Tel. (312) 939-9800
FAX: (312) 939-9828